CHOOSING AN APPROPRIATE CUTOFF POINT BASED ON THE FALSE-NEGATIVE AND FALSE-POSITIVE INTERSECT

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ABSTRACT. *The motivation for the present work is to search for a more appropriate cutoff point for the purpose of improving predictive accuracy in logistic regression models. In comparison with many previous studies, where the default rate may possibly be underestimated, our findings are more robust. Likelihood ratio testing, multicollinearity diagnostics and goodness-of-fit testing are utilized to search for a better logistic regression model. Our proposed approach, using the cutoff rate where the false-negative rate curve intersects the false-positive rate curve, gives better performance than using 0.5 or the total predictive error rate as the cut-off point. An empirical example is utilized to demonstrate the effectiveness, efficiency and robustness of the proposed techniques.*
Keywords: Default, Residential mortgages, False-positive rate, False-negative rate, Cutoff point

1. **Introduction.** Banks generally ensure that the loan-to-value (LTV) ratio of residential mortgages is less than 90% [1]. Diagnostic testing can play an important role in analyzing the likelihood of home-owners to default on residential mortgages. Criteria have been developed for interpreting those factors which influence the likelihood of residential mortgage default. For example, Green and Shoven [2] indicated that the difference between the face value of the mortgage and its market value in the housing market has a significant effect on the possibility of default on fixed-rate mortgages (FRMs). Lawrence *et al.* [3] proved that the mortgagors' credit history and age, the contract maturity, the loan to value (LTV) ratio and the ratio of mortgage payments to family income are all crucial to the likelihood of default. Archer *et al.* (1996) concluded that residential mortgage terminations are affected by both household income and collateral value. Deng *et al.* [4-6] showed that the present value of the mortgage payments, characteristics of the family, LTV ratio, home equity, unemployment rate and divorce rate are also significant factors. Kau and Keenan [7] indicated that the LTV and market housing price are significant. Ciochetti *et al.* [8] concluded that the LTV ratio is positively related to default, but that the debt coverage ratio (DCR) is more significant than the LTV ratio. Marrison [1] introduced the Fair Issac & Company (FICO) score model, detailing credit-bureau information on a retail customer, such as age, income, total number of credit cards and number of delinquencies in the last three years, to calculate the likelihood of default. Lin and Liu [9] presented empirical results showing that education, marital status, income, credit history and the location of the collateral are critical to mortgage default in Taiwan. More recently, Kaneko and Nakagawa [10] proposed a pricing model for a principal-equal-repayment loan that is commonly used in Japan. They also illustrated the model with real accounting data from Japanese non-listed companies.